CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/BRD/W.No.05/CSR-01/236j/CEMENT/2016-17 Date: 05.01.2017

TEST REPORT ON CEMENT

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Cement
Sample Received on	:	03.01.2017
Period of Testing	:	03.01.2017 to 05.01.2017

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988 (RA-2014)	29.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988 (RA-2014)	150 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988 (RA-2014)	490 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988 (RA-2014)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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VIDYARANI P.K.
Technical Manager

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ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

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E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/BRD/W.No.05/CSR-01/236j/SAND-Gradation/2016-17 05.01.2017

TEST REPORT ON SIEVE ANALYSIS OF FINE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Fine Aggregates
Technical Reference	:	IS : 2386 (Part 1) - 1963 (RA-2011)
Sample Received On	:	03.01.2017
Date of Testing	:	05.01.2017

Total Wt. of Aggregates in gms = **1000**

IS Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2011)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	96.80	90-100	90-100	90-100	95-100
2.36	81.20	60-95	75-100	85-100	95-100
1.18	60.70	30-70	55-90	75-100	90-100
600 Micron	31.50	15-34	35-59	60-79	80-100
300 Micron	11.80	5-20	8-30	12-40	15-50
150 Micron	4.60	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-28

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VIDYARANI P.K.
Technical Manager

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Job No.: CTCE/BBMP/BRD/W.No.05/WMM/Gradation/2016-17 09.01.2017

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	09.01.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Morth Table 400-13
53	0	0	0	100	100
45	115	115	2.3	97.7	95-100
22.4	1485	1600	32.00	68.00	60-80
11.2	1120	2720	54.40	45.60	40-60
4.75	520	3240	64.80	35.20	25-40
2.36	485	3725	74.50	25.50	15-30
0.600	425	4150	83.00	17.00	8-22
0.075	615	4765	95.30	4.70	0-8

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/BRD/W.No.05/WMM/Gradation/2016-17 20.01.2017

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	20.01.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Morth Table 400-13
53	0	0	0	100	100
45	110	110	2.2	97.8	95-100
22.4	1545	1655	33.10	66.90	60-80
11.2	1055	2710	54.20	45.80	40-60
4.75	575	3285	65.70	34.30	25-40
2.36	460	3745	74.90	25.10	15-30
0.600	495	4240	84.80	15.20	8-22
0.075	590	4830	96.60	3.40	0-8

*Information is furnished by the Customer/Representative.

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ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-26

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Job No.: CTCE/BBMP/BRD/W.No.05/WMM/Gradation/2016-17

31.01.2017

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	31.01.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Morth Table 400-13
53	0	0	0	100	100
45	105	105	2.1	97.9	95-100
22.4	1645	1750	35.00	65.00	60-80
11.2	1020	2770	55.40	44.60	40-60
4.75	550	3320	66.40	33.60	25-40
2.36	475	3795	75.90	24.10	15-30
0.600	495	4290	85.80	14.20	8-22
0.075	520	4810	96.20	3.80	0-8

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/BRD/W.No.05/WMM/Gradation/2016-17 06.02.2017

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	06.02.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Morth Table 400-13
53	0	0	0	100	100
45	100	100	2.0	98.0	95-100
22.4	1485	1585	31.70	68.30	60-80
11.2	1125	2710	54.20	45.80	40-60
4.75	560	3270	65.40	34.60	25-40
2.36	440	3710	74.20	25.80	15-30
0.600	510	4220	84.40	15.60	8-22
0.075	585	4805	96.10	3.90	0-8

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/BRD/W.No.05/WMM/AIV/2016-17

09.01.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS : 2386(Part -4)-1963 (RA-2011)
Date of Testing	:	09.01.2017

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	391	393	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	90	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	304	303	
4	Aggregate Impact value = percent fines 100* (W2/W1)%	22.25	22.90	22.58

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

Note:

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ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ, ಬೆಂಗಳೂರು-24

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TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386(Part 1) 1963 (RA 2011)
Date of Testing	:	09.01.2017

Sl.No.	Description	Result
1	Flakiness Index	12.36%
2	Elongation Index	13.90%
3	Combined Flakiness & Elongation Index	26.26%

*Information is furnished by the Customer/Representative.

Civil-Tech Consultants & Engineers Bangalore

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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AE ward no 5

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ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-24

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Job No.: CTCE/BBMP/BRD/W.No.05/SDBC/AIV/2016-17 20.02.2017

TEST REPORT ON AGGREGATE IMPACT VALUE

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of the Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Semi Dense Bituminous Concrete
Technical Reference	:	IS : 2386 (Part-4)-1963 (RA-2011)
Type of Mix	:	Hot Mix Plant, Bangalore
Date of Testing	:	20.02.2017

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	307	303	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.08	22.31	**21.69**

* Information is furnished by the Customer/Representative

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/BRD/W.No.05/SDBC/Shape_T/2016-17 20.02.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
Sample ID	:	Semi Dense Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
Date of Testing	:	20.02.2017

Sl.No.	Description	Result
1	Flakiness Index	11.93%
2	Elongation Index	13.28%
3	Combined Flakiness & Elongation Index	25.21%

* Information is furnished by the Customer/Representative

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/BRD/W.No.05/SDBC/Stripping/2016-17 20.02.2017

TEST REPORT ON STRIPPING VALUE OF ROAD AGGREGATES (STATIC IMMERSION TEST)

* **Customer**	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* **Agency**	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* **Name of the work**	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* **Reference**	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* **Sample ID**	:	Semi Dense Bituminous Concrete
Technical Reference	:	IS: 6241
Date of Testing	:	20.02.2017

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping,	Average,	Average Retained
1	3.1	3.20	96.80
2	3.2		
3	3.3		

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* Information is furnished by the Customer/Representative

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

Note:

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Job No.: CTCE/BBMP/BRD/W.No.05/SDBC/Sp_Wa/2016-17 20.02.2017

TEST REPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION TEST

* Customer	:	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of the Work	:	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	:	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
* Sample ID	:	Semi Dense Bituminous Concrete
Technical Reference	:	IS : 2386 (Part-3)-1963 (RA-2011)
Type of Mix	:	Hotmix Plant, Bangalore
Date of Testing	:	20.02.2017

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2018	2019	2020	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1263	1264	1265	
4	Weight of saturated surface dry aggregate in air	W_3 g	2012	2013	2014	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	749	749	749	
6	Weight of oven dried aggregate	W_4 g	2001	2002	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.672	2.673	2.677	2.674
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.711	2.713	2.709	2.711
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.55%	0.55%	0.45%	0.52%

* Information is furnished by the Customer/Representative

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/BRD/W.No.05/SDBC/Bitumen/2016-17 20.02.2017

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

* Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	**Mr. B.R. Dhananjaya,** Nagashettyhalli, Bangalore.
* Name of Work	Improvements to road and drains at Poojamahalakshmi Layout cross road in Ward No.05 in Thirumenahalli Village Limits, BBMP, Bangalore.
* Reference	EE/BTP/BBMP/E-PMT/596/2013-14 Dated: 03.03.2014
SAMPLE I/D	Roads in Poojamahalakshmi Layout cross road in Ward No.05
DATE OF TESTING	20.02.2017

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	473.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.50
7. Bitumen content in %	4.90	5.30
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.26	6.78	6.78	93.22	90-100
4.75	263.1	55.33	62.12	37.88	35-51
2.36	32.28	6.79	68.90	31.10	24-39
1.18	45.12	9.49	78.39	21.61	15-30
0.3	49.36	10.38	88.77	11.23	9-19
0.075	25.69	5.40	94.18	5.82	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.29	6.46	6.46	93.54	90-100
4.75	262.4	52.48	58.94	41.06	35-51
2.36	60.23	12.05	70.98	29.02	24-39
1.18	45.12	9.02	80.01	19.99	15-30
0.3	36.31	7.26	87.27	12.73	9-19
0.075	41.22	8.24	95.51	4.49	3-8

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